

REMARKS

Corrected Filing Receipt

Please note that on August 22, 2006, a Request for Corrected Filing Receipt was mailed to the USPTO in order to correct the filing date of the present application (copy of request enclosed as Attachment A). Although a stamped, return postcard was returned by the USPTO (copy also enclosed as Attachment B), to date, no corrected filing receipt has been issued. The undersigned respectfully requests that the filing date of the application be corrected and that a corrected filing receipt be issued.

Response

In response to the Official Action of December 17, 2007, claims 1-3, 6-21, and 26 have been amended and claim 32 is newly presented. No new matter has been added. Claim 32 corresponds to claim 15, but written using means plus function terminology.

An amended title is presented which is believed to be descriptive, including indicating that the postfiltering of speech signals reduces coding noise and background acoustic noise.

Claim Rejections - 35 USC §101

At section 1, claim 26 is rejected under 35 USC §101 as directed to non-statutory subject matter. Appropriate amendment has been made and therefore amended claim 26 is believed to be statutory.

Claim Rejections - 35 USC §103

At section 2, claims 1-3, 8-10, 15-17, 21, and 26 are rejected under 35 USC §103(a) as unpatentable over US patent 4,133,976, Atal, et al (hereinafter Atal) in view of US patent 5,706,395, Arslan, et al (hereinafter Arslan). For the reasons set forth below, it is respectfully submitted that these claims are now distinguished over the cited art.

More particularly, claim 1 has been amended in a manner which particularly points out and distinctly claims that the filter recited is for reduction of distortion, including quantization noise, associated with speech coding. This is disclosed in the specification, including as shown in Figure 3 and the accompanying description at page 2, lines 1-7 of the PCT published application.

Claim 1 has also been amended to indicate that the action of applying said adapted filter to said speech signal is not only to reduce distortion, including quantization noise, associated with speech coding, but also to reduce background acoustic noise. Thus, claim 1 makes clear what is believed to be an inventive feature of the present invention; namely, that both background acoustic noise, (see page 4, lines 26-28 of the specification), and quantization noise associated with coding, are jointly handled by the claimed method. This is accomplished by estimating the background acoustic noise in the speech signal, adapting a filter associated with distortion caused by speech coding, including quantization noise, in view of the estimation of background acoustic noise so that both background acoustic noise and distortion caused by speech coding, including quantization noise, are jointly reduced by the method. This feature of the present invention is disclosed in the application as filed, including page 3, line 33 through page 4, line 3.

In the rejection of claim 1, reliance is made on Atal for showing a method of filtering a speech signal. The Office asserts that Atal predicts background acoustic noise in the speech signal with reference to column 9, lines 50-57 of Atal. However, Atal is directed to an adaptive filter associated with a predictive speech signal processor that concentrates quantizing error noise in spectral peaks corresponding to the time-varying formant portions of the speech spectrum so that the quantizing noise is masked by the speech signal formants (Atal, Abstract).

The referenced passage at column 9, lines 50-57 is directed to Figure 1 and discusses quantizing noise masking arrangement, but is totally silent with respect to background acoustic noise. Consequently, the filtering performed by Atal is not suitable nor indicated as suitable for filtering background acoustic noise. As clearly set forth in the Background of the Art section of the present invention, background noise is conventionally handled by separate noise suppression systems, such as Wiener filters

or spectral subtraction schemes, but that such solutions are computationally expensive and are not feasible for integration with speech codecs (page 2, lines 21-25 of the PCT published application). The present invention is directed to a method of improving over state of the art noise reduction by jointly handling background acoustic noise and distortion, including quantization noise associated with coding of speech signals; something that had heretofore not been accomplished by the state of the art.

Arslan is directed to an adaptive Weiner filter and thus represents the state of the art associated with separate handling of background noise suppression schemes. As is apparent to those skilled in the art, it is not obvious to combine a Weiner filter as disclosed in Arslan with an adaptive filter for reducing quantizing error noise associated with speech signal coding as disclosed in Atal.

In short, the Weiner filtering technique for reducing background acoustic noise as disclosed in Arslan would not, when combined with the coding filter disclosed in Atal, result in the method for adapting a filter suited for reduction of distortion caused by speech coding, including quantization noise, in the manner as presented in amended claim 1.

It is therefore respectfully submitted that claim 1 is distinguished over Atal in view of Arslan.

Independent speech filtering apparatus claim 15 has been amended in a manner similar to claim 1 and, for similar reasons, is also believed to be distinguished over Atal in view of Arslan. Please note that claim 15 has also been amended to recite a speech filtering apparatus and is written to not use means plus function terminology. The claims which depend from claim 15 have also been amended in view of the amendment to claim 15.

In addition, newly submitted speech filtering apparatus claim 32 is also believed to be distinguished over the cited art since it corresponds to claim 15, but written using means plus function terminology.

Each of the dependent claims is believed to be allowable at least in view of their dependency from independent claims which are believed to be distinguished over the cited art.

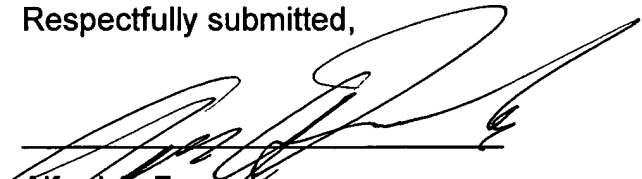
Since each of the claims is believed to be distinguished over the cited art, it is respectfully submitted that the present application as amended is in condition for allowance and such action is earnestly solicited.

Respectfully submitted,

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